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**THE RELATIONSHIP OF HUMAN PSYCHOLOGICAL
CHARACTERISTICS WITH ATHLETIC PERFORMANCE**

GRANT P. MURRAY

PLAN B PAPER

December 1, 2000

ADVISORY COMMITTEE SIGNATURES

This paper is submitted in partial fulfillment of the requirements for the Master of Science degree in Psychology, Department of Psychology, Utah State University.

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TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
I. Executive Summary	1
II. Introduction.	4
A. Problem Statement	4
B. Research Questions	6
C. Potential Benefits of Studying This Topic.	7
III. Methodology.	9
Sources of Information.	9
IV. Findings and Discussion	21
A. Individual Psychological Characteristics Previously Studied in Relationship to Athletic Performance.	22
1. Aggression Orientation	22
2. Anxiety/Negativism (Perception of)	22
3. Commitment Orientation	25
4. Competition Orientation	26
5. Decisional Processing Capability	28
6. Global Self-Worth (Perception of)	28
7. Goal Orientation	30
8. Imagery or Visualization Capability	31
9. Participation/Involvement (Perception of)	35
10. Perfection (Achievement) Orientation	36
11. Physical Competence (Perception of)	37
12. Sex Role/Gender Orientation	39
Summary	40
B. Social-Psychological and Sociological Characteristics Previously Studied in Relationship to Athletic Performance	40
1. Social-Psychological Perspectives	40
2. Demographic Characteristics	42
Summary	43
C. Group (Team) Psychological Characteristics Previously Studied in Relationship to Athletic Performance.	43
1. Aggression Orientation	43
2. Commitment Orientation	44
3. Goal Orientation	44
4. Human Resource Capacities	45
5. Image or Visualization Capability	48
Summary	50
V. Conclusions and Recommendations.	51
A. Conclusions	51
B. Recommendations	62
VI. Research Caveats and Future Study Ideas.	64
References.	65

LIST OF TABLES

Table

Page

1. Descriptions of Literature Review Articles 11
2. Summary of Evidence for Studied Relationships 61

I. EXECUTIVE SUMMARY

The purpose of this paper is to report the findings of a literature review summary on the topic of the relationship of human psychological characteristics with athletic performance. Two research questions guided its development: (1) Is there any evidence that there is a relationship between individual human psychological characteristics and athletic performance? (2) If there is any evidence that there is a relationship between individual human psychological characteristics and athletic performance, is there further evidence that those individual characteristics translate in some way into group dynamics or attributes that may similarly influence team performance?

Relying upon three commonly used, computer-assisted literature review software tools--PsychINFO, Medline, and Educational Resources Information Center (ERIC)--and searching a previous 10-year period, the author obtained sixty potential articles related to the topic. On the basis of a content analysis of the abstracts and a casual examination of the contents of the articles, 31 articles were eliminated because the nature and content of the described material did not appear to lend itself well to the topic. One article (Oliver, 1995), for example, focused on the impact of motivational factors on students' classroom scholastic performance, not on athletic performance. Another article (Straub and Hinman, 1992) identified leading sport psychologists and summarized their perspectives on graduate education and training. Several other eliminated articles were theoretical only, postulating relationships but not reporting on actual field-based studies.

The findings of the remaining 29 articles are presented in the paper. They were included because the authors reported on original field-based research and/or summarized the work of previous investigators who had studied psychological characteristics in relationship to athletic performance.

Abernethy (1999), for example, cited and reviewed the works and findings of several authors in recent years who have perpetuated the work of Coleman Griffith, North America's first sport psychologist. The reported studies were relevant to the subject of this paper.

To simplify the synthesis of all of the available information, the psychological characteristics were organized into nineteen categories based upon the literature reviewed and the topics read. The categories included: aggression orientation, anxiety/negativism (perception of), commitment orientation, competition orientation, decisional processing capability, global self-worth (perception of), goal orientation, imagery or visualization capability, participation/involvement (perception of), perfection (achievement) orientation, physical competence (perception of), sex role/gender orientation, social psychological perspectives, demographic characteristics, and characteristics related to team dynamics (i.e., aggression, commitment, human resource capacities, and imagery or visualization capability).

The results of the literature review disclosed varying levels of evidence for the existence of a relationship among the characteristics and athletic performance. Those categories with substantial empirical evidence of a relationship included: anxiety/negativism (perception of), global self-worth, imagery or visualization capability, and physical competence (perception of). Categories with some empirical evidence included aggression orientation, commitment orientation, competition orientation, decisional-processing capability, goal orientation, participation/involvement (perception of), perfection (achievement) orientation, sex role/gender orientation, social psychological perspectives, and demographic characteristics. Five group (team) categories, aggression orientation, commitment orientation, goal orientation, human resources capacities, and imagery or visualization capability elicited some empirical evidence for the studied relationship.

Recommendations are made for improving athletic performance and satisfaction with performance. Ideas are presented to encourage individuals, teammates, coaches, parents, educators, and society in general to achieve improved athletic performance. Research shortcomings are identified and potential future study ideas are presented.

II. INTRODUCTION

A. Problem Statement

Athletes of all types and of all levels of physical prowess exist in American society. For that matter athletics has become increasingly important throughout the broader context of world society.

It represent a multi-billion dollar industry. Evidence abounds of an ever-increasing number of professional athletes who receive multi-million dollar salaries. Also, a growing number of Americans are getting involved in physical fitness programs. People pay a lot of money to buy equipment, to participate individually and in teams, to learn athletic techniques, to train and to compete in athletic competition. Athletic competition is becoming more and more popular. It is intensifying in sensationalism as illustrated by the so-called sport of professional wrestling. Athletics, in general, are attracting more and more spectators as professional franchises now exist in most every sport.

Coaches, parents and athletes are keenly interested in why some people seem to excel so much better in athletics than others. Is excelling determined only by hard work in physical training so an individual can become a better physical specimen than someone else? Is there something in-bred genetically in an individual that makes him or her a better athlete than someone else? Is athletic excellence a product only of learning how to compete successfully? Does an individual develop certain psychological traits over the course of his/her socialization and character development that could influence him/her to excel in physical competition? Obviously there are a number of possible explanations. Superior athletic performance could be related to a combination of factors, physical, social, psychological, and spiritual.

This literature review summary focuses on psychological characteristics which may have a relationship with athletic performance. The major objective is to determine if there is any evidence that athletes weak or lacking in the characteristics perform somewhat less well than those who are high in the characteristics. In this summary, psychological characteristics are defined as mental properties, attributes, traits, and mannerisms that predispose an individual to behave in a certain way in relation to his/her environment. Such characteristics are acquired through growing-up experiences and socialization processes that result in personality development.

There is quite a lot of evidence or justification for studying psychological characteristics in relation to athletic performance. In an insightful article, Abernethy (1999) reviewed the pioneering work of Coleman R. Griffith, chronologically North America's first sport psychologist. Abernethy concluded that:

"Griffith had a precocious vision of, and for, the field of sport psychology. He had an unerring capacity to predict and advance both theories and observations which are relevant today as they were more than seventy years ago (page 127) There is clear recognition in Griffith's writings of equal suitability of the laboratory and the gymnasium/sport field as settings for sport psychology research. He saw potential of the research to produce knowledge that might eventually be of value and could be applied in assisting sport performance, learning, and/or coaching (page 128)."

Abernethy cites the work of several authors in recent years who have chronicled Griffith's contributions, and perpetuated his work through their own research efforts.

According to Abernethy (1999) sport psychology in the 1960's and 1970's had a bias toward laboratory-based research but this has been reversed in the past two decades with a swing toward

more applied, field-based research. It will become evident that the research articles to be discussed in this paper are reports on studies of psychological characteristics derived from field-based research.

B. Research Questions

Of interest to sport psychologists is whether individual psychological characteristics are associated with athletic prowess, and also whether such factors may similarly influence team performance. The following two research questions have guided the study of this topic:

1. Is there any evidence that there is a relationship between individual human psychological characteristics such as aggression orientation, anxiety, global self-worth, goal orientation, etc. and athletic performance?
2. If there is any evidence that there is a relationship between individual human psychological characteristics and athletic performance, is there further evidence that those individual characteristics might translate in some way into group dynamics or attributes that may similarly influence team performance?

Researchers of athletics behavior more commonly focus upon the athlete and athletic performance as relates to motor learning, physiology, and kinesiology. The study of the relationship of the psychological characteristics of the athlete to the activity of sport performance is perhaps as equally important to developing a full understanding of how the whole makeup of the individual contributes to athletic performance and mental toughness. If we are able to determine with some degree of certainty that psychological human nature contributes to athletic performance, such knowledge could help athletes, team members, coaches, parents, educators and society develop methods for enhancing athletic performance, and human satisfaction with that performance. As

Ludwig (1996) concluded, "Sport psychology is playing a more influential and respected role than ever before in the pursuit of excellence in sport. Athletes are seeking mental training and counseling on a daily basis. Sport psychologists are in high demand (page 31)."

C. Potential Benefits of Studying This Topic

What is to be gained by a study of this topic and obtaining answers to the research questions? Discovering more about how a person's mental processes contribute to their performance in sports will help us to understand more about the influence of human nature on athletics. Studying the first creation of the physical execution in the mind is crucial to understanding the mind-body (soul) interrelationship during actual sports performance. Understanding the influence of human psychological characteristics and their relationship to athletic performance is essential to learning how to improve the performance and to exercise control upon its outcome.

The ability to understand more about sport psychology will also give coaches and competitors a tool for developing mental toughness and a performance edge. For example, Ludwig (1996) notes that some of the common requests that female athletes utilizing the services of sport psychology are concerned with are, "... visualization, arousal control, confidence, assertiveness and aggression training, burnout avoidance, concentration, motivation, focusing and refocusing, and coping with obstacles (page 32)." Athletes and coaches are concerned with being able to direct and change psychological processes that affect performance and manipulate the processes towards success and away from failure.

In summary, the study of this topic can result in several potential benefits as follows:

1. Individuals who want to achieve higher levels of satisfaction in athletic performance may be able to concentrate on developing those psychological characteristics which will enhance their performance.
2. Teammates who have a desire to work together to achieve a common performance goal may understand better the group dynamics that produce success in athletic competition.
3. Coaches, of both individual and team sports, can be able to learn about and develop in their athletes those characteristics that should be instilled at both levels of competition to improve their athletic performance.
4. Parents of offspring who have high achievement needs in athletic performance may be able to identify and seek to socialize or develop in their children those enabling psychological characteristics that will make for better athletic performance.
5. Educators might be able to concentrate on and emphasize in their instructional curricula the gaining of knowledge and development of those attributes that will enhance athletic performance.
6. Society in general may benefit by learning what it is that motivates individuals and teams in athletic competition. Some of these same explanations may help us to understand spectators' behavior as well.

III. METHODOLOGY

This section contains a description of the research design and the sources of information used to answer the research questions.

Sources of Information

The sources of information for this research project included a thorough reading of several diverse psychological and social-psychological periodicals. Articles were for the most current 10-year period. The articles were obtained with the aid of three commonly used computer-assisted literature review software tools--PsychINFO, Medline, and Educational Resources Information Center (ERIC). Literature searches were conducted by focusing on the following key words and/or combinations of words: athletic performance, characteristics, motivations, physical performance, psychology, sport psychology, and sports. The searches were completed at the University of Utah Marriott Library. Printouts of article citations and abstracts were obtained. Copies of all of the articles were obtained from the Brigham Young University, Harold B. Lee Library. It was not necessary to use the Interlibrary Loan Service since all of the articles were readily available.

Upon completion of the computer assisted search, 60 potentially-useful articles related to the research topic were identified. On the basis of a content analysis of the abstracts and a casual examination the contents of the articles, 31 articles were eliminated because the nature and content of the described material did not appear to lend itself well to the topic. For example, one article (Oliver, 1995) focused on the impact of motivational factors on students' classroom scholastic performance, not on athletic performance. Another article (Straub and Hinman, 1992) identified leading sport psychologists and summarized their perspectives on graduate education and training.

Other eliminated articles contained a summary report on the current status of sports psychology research or they were theoretical only, postulating relationships but containing no results from actual field-based research. Ultimately 29 articles were reviewed and information was extracted to answer the research questions. The articles were included because the authors reported on original field-based research and/or summarized the work of previous investigators who had studied psychological characteristics in relationship to athletic performance. Table 1, pp. 11-20 contains a chronological listing with accompanying descriptive information of the 29 articles selected for review to accomplish the study objectives.

Table 1: Descriptions of Literature Review Articles

Authors, Title, Year, Sample Detail	Study Period	Major Findings
Abernethy, B. "The 1997 Coleman Roberts Griffith Address, Movement Expertise: A Juncture Between Psychology Theory and Practice." <i>J Appl Spt Psych</i> 11:126-141, 1999. (N=N/A; literature review and synthesis of others' conclusions).	Last four decades: 1960-1999	<ol style="list-style-type: none">1. Focuses on pioneering work of Coleman R. Griffith--theory-practice integration through applied research and eclectic focus on perception, decision-making and movement control and learning.2. Uncovers distinguishing attributes of expert performance.3. Uses knowledge of expert perception to assess current and prospective training strategies to enhance perceptual skill.
Hellandsig, E.T. "Motivational Predictors of High Performance and Discontinuation in Different Types of Sports Among Talented Teenage Athletes." <i>Intl J Sport Psych</i> , 29:27-44, 1998. (N1=352 at age 15-16; N2=305 at age 16-17; N3=285 at age 17-18; teenage athletes, both genders studied three times over three year period).	1996-1998	<ol style="list-style-type: none">1. Competitiveness, win orientation and importance of physical competence, attributed to self and sport mates, predicted high performance in all types of sports.2. Negativism (intrinsically provoked hostile actions) predicted high performance in different sports.3. High scores on goal orientation and importance of friendship attributed to self best predicted high performance in endurance sports.4. A significantly more optimistic lifestyle was predominant among skilled performers of risk sports compared to skilled performers of safe sports.5. Medium range scores for win orientation in previous years also predicted high performance in risk and safe sports.6. Discontinuation of sports was best predicted from reactive negativism (extrinsically provoked hostile actions) and proactive negativism among males.

Authors, Title, Year, Sample Detail	Study Period	Major Findings
Iwasaki, Y. and M.E. Havitz. "A Path Analytic Model of the Relationships Between Involvement, Psychological Commitment, and Loyalty." <i>J Leisure Res</i> 30(2):256-280, 1998. (N=N/A; literature review and synthesis of others' conclusions).	Last two decades: 1980-1997	<ol style="list-style-type: none"> 1. Individuals go through sequential psychological processes to become loyal sport participants. 2. The processes include: <ol style="list-style-type: none"> A. Formation of high levels of involvement in activity. B. Development of psychological commitment to a brand (brand name or type of sport). C. Maintenance of strong attitudes toward resistance to change preferences of the brand. 3. Both personal characteristics and social-situational factors moderate the developmental processes.
Bungum, T.J. and M.L. Vincent. "Determinants of Physical Activity Among Female Adolescents." <i>Am J Prev Med</i> 13(2):115-122, 1997. (N=852; females).	1996	<ol style="list-style-type: none"> 1. Ethnic group (Caucasians more active) and age (younger more active) were significant influences on physical activity. 2. Nurture from biological fathers, self efficacy and participation in organized sports were associated with physical activity. Viewing of two or more hours of television per night negatively influenced physical activity.
Hoyle, R.H. and S.S. Leff. "The Role of Parental Involvement in Youth Sport Participation and Performance." <i>Adolescence</i> 32(125):233-243, 1997. (N=24; 15 males and 9 females; tennis players).	1996	<ol style="list-style-type: none"> 1. Parental support was significantly associated with enjoyment (objective measure of performance) but not players' self-reported level of performance. 2. Parental support was significantly associated with the importance players' ascribed to their game. 3. Players with a reported higher level of parental support tended to report greater enjoyment, view tennis as a more important part of their lives, fall lower in state rankings than players who reported a lower level of parental support. 4. Parental support appeared to mediate relations among several player characteristics.

Authors, Title, Year, Sample Detail	Study Period	Major Findings
Raedeke, T.D. "Is Athlete Burnout More Than Just Stress? A Sport Commitment Perspective." <i>J Spt & Exer Psych</i> 19:396-417, 1997. (N=236; 145 females; 84 males; swimmers).	1996	<ol style="list-style-type: none"> 1. Athletes are likely to experience burnout if they are involved in sport primarily for entrapment-related reasons (have to be involved). 2. Athletes who exhibited characteristics reflecting sport entrapment generally demonstrated higher burnout scores than athletes who were primarily involved in sport for attraction-related reasons (want to be involved). 3. Results provide support for a commitment perspective.
Rosenfeld, L.B. and J.M. Richman. "Developing Effective Social Support: Team Building and the Social Support Process." <i>J Appl Spt Psych</i> 9:133-153, 1997. (N=N/A; literature review and synthesis of others' conclusions).	1996	<ol style="list-style-type: none"> 1. Team members who provide each other with social support (listening support, reality confirmation support, task appreciation support) offer each other the opportunity to increase their physical and emotional well-being. 2. Teams that employ strategies to enhance their social support are more likely to build a working, achieving, successful organization, one with effective communication and shared commitment to team goals and a team vision of success.
Weiss, M.R., Ebbeck, V. and T.S. Horn. "Children's Self-Perceptions and Sources of Physical Competence Information: A Cluster Analysis." <i>J Spt & Exer Psych</i> 19:52-70, 1997. (N=183; 85 females & 98 males; ages 8-13 years).	1996	<ol style="list-style-type: none"> 1. Four distinct profiles (clusters) of children were identified: <ol style="list-style-type: none"> A. Younger, higher in competitive trait anxiety (CTA), lower in perceived physical competence (PC), strong preference for pre-game anxiety (PA). B. Lower perceived PC and SE (self esteem); lower importance on parental evaluation (PE) and PA. C. Higher on perceived PC and SE, lower on CTA, preferred self-referenced and PE. D. Older, higher in CTA, lower in PC and SE, strongest preference for social comparison/evaluation criteria. 2. Children use age and psychological characteristics to evaluate their physical competence.

Authors, Title, Year, Sample Detail	Study Period	Major Findings
Laugier, C. and M. Cadopi. "Representational Guidance of Dance Performance in Adult Novices: Effect of Concrete vs. Abstract Movement." <i>Intl J Spt Psych</i> 27:91-108, 1996. (N=32; females).	1995	<ol style="list-style-type: none"> 1. Study subjects correctly represented form and temporal dimensions of videotaped dance movements, whatever the nature of the movements learned. 2. Concreteness (image specificity) had a facilitating effect on the quality of motor performance.
Anshel, M. "Coping Styles Among Adolescent Competitive Athletes." <i>The J of Soc Psych</i> 136(3):311-323, 1996. (N=428; males in team sports).	1995	<ol style="list-style-type: none"> 1. Four coping styles were studied, including avoidance, approach, problem-focused and emotion-focused. 2. Avoidance and approach styles are relatively independent; problem-focused and emotion-focused have far more commonality. 3. There is evidence that coping style is one component of a person's response to acute stress. Some individuals are more likely to use avoidance than approach as a coping style. 4. The use of problem-focused and emotion-focused coping techniques is more suspect than avoidance and approach techniques. 5. Some stressors appear to be more productive of coping styles than others.
Magill, R.A. and B. Schoenfelder-Zohdi. "A Visual Model and Knowledge of Performance as Sources of Information for Learning a Rhythmic Gymnastics Skill." <i>Intl J Spt Psych</i> 27:7-22, 1996. (N=48; female gymnasts).	1995	<ol style="list-style-type: none"> 1. Observing a model of a rhythmic gymnastic rope skill and receiving knowledge of performance (KP) provided no additional advantage over either observing a model and not receiving KP or receiving KP and not observing a model. 2. Subjects who observed the model needed less KP about body and limb coordination features of the skill than subjects who did not observe the model, but needed more KP about characteristics of handling the rope. 3. Results support the hypothesis that observing a model provides information which facilitates the development of appropriate coordination patterns required to perform a complex motor skill.

Authors, Title, Year, Sample Detail	Study Period	Major Findings
Stephens, D.E. and B.J.L. Bredemeier. "Moral Atmosphere and Judgments About Aggression in Girls' Soccer: Relationships Among Moral and Motivational Variables." <i>J Spt & Exer Psych</i> 18:158-173, 1996. (N=212; female soccer players).	1995	<ol style="list-style-type: none"> 1. Players who describe themselves as more likely to aggress against an opponent also were more likely to identify a larger number of aggressive teammates, perceive their coach placed greater importance on ego-oriented goals, chose situations featuring preconventional rather than conventional moral motives as more tempting for aggressive action. 2. Young athletes' aggressive behavior is related to their team's "moral atmosphere," including team aggressive norms, players' perceptions of these team norms and coach characteristics, and players' moral motives for behavior.
Lerda, R., Garzunal, R. and P. Therme. "Analogic Transfer: A Strategy for Adapting to Spatial Constraints." <i>Intl J Spt Psych</i> 27:133-145, 1996. (N=67; males divided into 6 groups).	1983	<ol style="list-style-type: none"> 1. Experts (more skilled players) are better at adapting to environmental changes (variations in dimensions of playing areas or spatial conditions) than non-experts (less skilled players). 2. The existence of schemata (expectation systems containing knowledge about the invariants of familiar situations) seem to direct information processing, thereby producing superiority in experts.
Ludwig, M.M. "A Sport Psychology Perspective." <i>J Phys Ed Rec & Dance</i> 67:31-33, 1996. (N=N/A; literature review and synthesis of others' conclusions).	Last two decades: 1980-1995	<ol style="list-style-type: none"> 1. Perceptual social and gender role issues make women more receptive to psychological services. 2. Attention control and anxiety dominate women's psychological needs. 3. Women request training such as visualization, arousal control, confidence, assertiveness and aggression training, burnout avoidance, concentration, motivation, focusing and refocusing, and coping with obstacles.
Fung, L. and F.H. Fu. "Psychological Determinants Between Wheelchair Sport Finalists and Non-finalists." <i>Intl J Spt Psych</i> 26:568-579, 1995. (N=300; finalists and non-finalists).	1994	<ol style="list-style-type: none"> 1. Commitment, vigour (sic), confusion and tension had coefficients larger than .30 when comparing finalist and non-finalist differences. 2. Wheelchair athletes with differing performance levels possessed unique levels of psychological characteristics, i.e., trait anxiety, tension, depression, anger, confusion, vigour (sic), fatigue, commitment, and self-criticism.

Authors, Title, Year, Sample Detail	Study Period	Major Findings
Stein, G.L., Kimiecik, J.C., Daniels, J. and S.A. Jackson. "Psychological Antecedents of Flow in Recreational Sport." <i>Pers & Soc Psych Bull</i> 21(2):125-135, 1995. (N1=44; N2=25; N3=17; three studies of athletes in different sports).	1994	<ol style="list-style-type: none"> 1. In a learning milieu students in flow experienced greater enjoyment, satisfaction, concentration and control than their counterparts in boredom, apathy or anxiety. 2. In a competitive milieu athletes in flow or boredom states had a better quality of experience than individuals in apathy or anxiety states. 3. Contextual differences influence why an athlete perceives a situation as optimal. 4. The psychological antecedents of flow for sports participation remain unidentified, as neither goals, competence, nor confidence predicted the flow experience.
Wright, P.M., Smart, D.L. and G.C. McMahan. "Matches Between Human Resources and Strategy Among NCAA Basketball Teams." <i>Acad Mgmt J</i> 38(4):1052-1074, 1995. (N=134 teams).	1993	<ol style="list-style-type: none"> 1. Coaches' preferred strategies influence the characteristics they look for in recruits. 2. Teams implementing a strategy different from a coach's preferred strategy performed less well than those implementing a coach's preferred strategy. 3. Human resource capacities, the decisive factor, interacted with the coach's strategy in determining team performance for two different measures of performance.
Ebbeck, V. "Self Perception and Motivational Characteristics of Tennis Participants: The Influence of Age and Skill." <i>J of Appl Sport Psych</i> 6:71-86, 1994. (N=240; 115 males and 125 females; ages 10-67 years; tennis players).	1993	<ol style="list-style-type: none"> 1. Age and skill were significantly related to psychosocial variables for both males and females. 2. Psychosocial variables studied included perceived tennis competence, tennis salience, global self-worth, challenge motivational orientation, task and ego orientations and competitive trait anxiety.
Krane, V. and J.M. Williams. "Cognitive Anxiety, Somatic Anxiety, and Confidence in Track and Field Athletes: The Impact of Gender, Competitive Level and Task Characteristics." <i>Intl J Spt Psych</i> 25:203-217, 1994. (N=216; male and female high school and college track field athletes).	1993	<ol style="list-style-type: none"> 1. Male athletes reported lower somatic anxiety and higher self-confidence than female athletes and college athletes displayed lower cognitive and somatic anxiety than high school athletes. 2. College male non-placers displayed lowest level of cognitive anxiety while high school male non-placers displayed the highest levels. 3. Only cognitive anxiety was found to differ in athletes in events of differing complexity with the high complexity athletes displaying greater cognitive anxiety than the low complexity athletes. 4. No significant anxiety or confidence differences were found among athletes in events of differing duration.

Authors, Title, Year, Sample Detail	Study Period	Major Findings
Wittig, A.F. and K.T. Schurr. "Psychological Characteristics of Women Volleyball Players: Relationships With Injuries, Rehabilitation, and Team Success." <i>Pers & Soc Psych Bull</i> 20(3):322-330, 1994. (N=115; female volleyball players).	1993	<ol style="list-style-type: none"> 1. Investigated relationship of four psychological factors with success of team, conference affiliation, occurrence of athletic injury, and adherence to rehabilitation plans. 2. An assertive, self-assured, independent attitude distinguished one conference from another, had higher values for successful than for unsuccessful teams, and was associated with higher injury rates. 3. For players suffering moderate or severe injuries, an assertive, self-assured, independent attitude was associated with adherence to rehabilitation plans. 4. The relationship of the factor with the several variables is explained as resulting from risk taking and positive deviance.
Weinberg, R.S. "Goal Setting and Performance in Sport and Exercise Settings: A Synthesis and Critique." <i>Med & Sci in Spts & Exer</i> 26:469-477, 1994. (N=N/A. Literature review of previous studies and conclusions about those studies and the need for future research).	Last two decades: 1980-1999	<ol style="list-style-type: none"> 1. Much of past research on goal setting has been conducted in industrial/organization settings. 2. In the last seven years there has been more focus on goal setting in sport and exercise settings. This has produced equivocal findings. 3. Studies focused on task characteristics, motivation and commitment, type of setting, goal difficulty, personal goals, spontaneous goal setting and competition. 4. More longitudinal studies are needed to follow athletes over the course of a season.
Murphy, S.A. "Imagery Interventions in Sports." <i>Med & Sci in Spts & Exer</i> 26:486-494, 1994. (N=N/A; literature review).	Last three decades: 1960-1993	<ol style="list-style-type: none"> 1. Research studies in four general categories are identified: <ol style="list-style-type: none"> A. Mental Practice. B. Precompetition Imagery. C. Comparisons of Successful and Unsuccessful Competitors. D. Mediating Variables. 2. Mental practice research has produced equivocal results. 3. The Mental Practice Model for research into imagery processes in sports is nonproductive.

Authors, Title, Year, Sample Detail	Study Period	Major Findings
<p>Coen, S.P. and B.M. Ogles. "Psychological Characteristics of the Obligatory Runner: A Critical Examination of the Anorexia Analogue Hypothesis." <i>J Spt & Exer Psych</i> 15:338-354, 1993. (N1=119; N2=142; registrants and runners in marathons).</p>	<p>1992</p>	<ol style="list-style-type: none"> 1. Obligatory runners train more miles, days and hours per week; have faster running times; are more likely to continue running when injured; and, report feeling higher levels of anxiety when not running. 2. Obligatory and nonobligatory runners were not significantly different on measures of identity diffusion or trait anger. They were significantly different on measures of perfectionism and trait anxiety.
<p>Glenn, S.D. and T.S. Horn. "Psychological and Personal Predictors of Leadership Behavior in Female Soccer Athletes." <i>J of Appl Sport Psych</i> 5:17-34, 1993. (N=106; female soccer players).</p>	<p>1992</p>	<ol style="list-style-type: none"> 1. Personal and psychological characteristics studied included perceptions of soccer competence (PSC), sex-role orientation--masculinity (M) or Femininity (F), competitive trait anxiety (CTA) and global self-worth (GSW). 2. Athletes who were high in PSC, F and M rated themselves higher in leadership ability than did athletes who scored low on these same psychological characteristics. 3. Athletes who were rated high in leadership ability by their peers exhibited high levels of CTA, M, skill and PSC. 4. Coaches' ratings of athletes' leadership tendencies were associated primarily with the players' actual skill competence. 5. Athletes who played in central field positions were more apt to be rated high in leadership ability by themselves and their coaches than were athletes in non-central field positions. 6. Results support the study hypothesis that certain psychological and personal characteristics can be used to identify peer group leaders in interscholastic soccer contexts.

Authors, Title, Year, Sample Detail	Study Period	Major Findings
McPherson, S.L. "The Influence of Player Experience on Problem Solving During Batting Preparation in Baseball." <i>J Spt & Exer Psych</i> 15:304-325, 1993. (N=24 male baseball players).	1992	<ol style="list-style-type: none"> 1. Propositional-type analysis of subjects' think-aloud protocols revealed experts' conceptual representation of baseball batting preparation. 2. Experts' rules were more tactical, refined and associated compared to novices' rules. 3. Experts were different from novices in what attributes were considered important to solving the problem. 4. Experts generated self-regulatory strategies to update, check and modify their predictions of pitcher characteristics. 5. Expert sport performers' conceptual knowledge underlies decision making in sports situations.
Brustad, R.J. "Integrating Socialization Influences Into the Study of Children's Motivation in Sport." <i>J of Spt & Exer Psych</i> 14:59-77, 1992. (N=N/A; literature review and synthesis of others' findings.)	Last three decades: 1970-1990	<ol style="list-style-type: none"> 1. Youth sport research has failed to address the influential role of socialization agents in shaping children's motivational processes in sport. 2. This paper encourages the integration of socialization influences, particularly parental behaviors, into the study of children's sports motivation. 3. Special attention is paid to related research in academic settings that identifies the influence of parental socialization patterns upon children's self-perception, orientations toward achievement, and patterns of motivated behavior.
Henschen, K.P., Horvat, M. and G. Roswal. "Psychological Profiles of the U.S. Wheelchair Basketball Team." <i>Intl J Spt Psych</i> 23:128-137, 1992. (N=24; disabled basketball players).	1991	<ol style="list-style-type: none"> 1. Subjects who made the team were significantly less tense and less angry than those who did not make the team. 2. Team members became significantly less critical of themselves and less trait anxious the closer they came to the actual Paralympic competition.
Jackson, S.A. "Athletes in Flow: A Qualitative Investigation of Flow States in Elite Figure Skaters." <i>J Appl Spt Psych</i> 4:161-180, 1992. (N=16; two singles; three teams of two; four pairs of two; total of 9 females and 7 males; elite figure skaters).	1991	<ol style="list-style-type: none"> 1. Factors perceived as most important for getting into skating flow included a positive mental attitude, positive pre-competitive and competitive affect, maintaining appropriate focus, physical readiness and unity with partner. 2. Factors which disrupted skating flow were physical problems/mistakes, inability to maintain focus, negative mental attitude, lack of audience response.

Authors, Title, Year, Sample Detail	Study Period	Major Findings
<p>Murphy, S.A. "Models of Imagery in Sports Psychology: A Review." <i>J of Mental Imag</i> 14(3&4):153-172, 1990. (N=N/A; Contains review of various research studies and observations about research shortcomings).</p>	<p>Last three decades: 1970-1999</p>	<ol style="list-style-type: none"> 1. Summarizes recent findings concerning the use of imagery in sport psychology as a psyching-up method. 2. Successful athletes may be more likely than their counterparts to engage in certain mental processes such as dreaming about their events, using internal imagery, and using imagery as a problem-solving device. 3. Employing an imaginal performance rehearsal strategy prior to performance has been shown to be an effective means of enhancing performance for a drawing task, and perhaps for golf putting and 10-pin bowling, but was not effective in dart-throwing or tennis serving.

IV. FINDINGS AND DISCUSSION

In this section of the paper the findings of the literature search and reviews are presented. After analyzing a plethora of information extracted from the articles, it was felt that a meaningful approach to summarizing the research would be to create selected and limiting categories of individual and group (team) characteristics which have been studied in relation to athletic performance. This seemed like a viable approach because there were so many psychological characteristics that had been studied and many of them were defined at various levels of abstraction, some very specific, some very general, etc. Moreover, in reviewing the literature it was observed that independent researchers often studied the same or similar characteristics. Often they used synonymous terms, although they appeared to be studying the same concept or some dimension thereof. For example, a category called "global self-worth" was created which independent investigators have studied to one extent or another using the following terms, global self-worth, self-assurance, self-efficacy, assertiveness, independence, win orientation, etc.

The risk in creating the categories is that they are not mutually exclusive; some of the synonymous terms may overlap from one category to another. Or, perhaps some of the synonymous terms might be viewed in the readers' eyes as constituting separate categories rather than being included with other terms. The advantage of this approach, however, is that it has helped to condense a lot of information into a logical explanatory framework.

Delineated and discussed below are several psychological (including a few social-psychological and sociological) characteristics presented alphabetically at both the individual and group levels of analysis.

**A. Individual's Psychological Characteristics
Previously Studied in Relationship to Athletic Performance**

Aggression Orientation--Includes terms or concepts such as aggressiveness and vigour (sic).

Two different sets of investigators studied aggressiveness or vigour (sic) as it relates to athletic performance. Stephens and Bredemeier (1996) administered a test battery to 212 female soccer players following a regularly scheduled league game. They found that players chose situations featuring preconventional (a concern for one's own personal welfare dominates) moral motives rather than conventional (a concern for maintaining the norms or expectations of one's family, social group, team, or society dominates) moral motives as more tempting for aggressive action.

Fung and Fu (1995) surveyed 300 finalists and non-finalists in wheelchair sports competition. They concluded that among other characteristics (commitment, confusion, tension) amount of vigour (sic) differentiated finalists from non-finalists. For individual wheelchair athletes, psychological determinants differentiated the more successful from the less successful athletes. Fung and Fu (1995) concluded: "In this study, score means indicated that the finalists were also less tense and less angry than the non-finalists, but on top of that, they were also less confused, less depressed, and more vigorous (page 576)." These characteristics help us to see what is responsible for distinguishing athletes who make the finals and those who do not make it. The performance of individual wheelchair athletes demonstrates the reality of psychological characteristics as they affect differing performance levels in sport behavior.

Anxiety/Negativism (Perception of)--Includes terms or concepts such as anxiety, cognitive anxiety, competitive trait anxiety, confusion, tension and coping strategies.

These characteristics have been studied previously by several different investigators. Three times over a three-year period, Hellandsig (1998) administered questionnaires to the same group of teenage athletes of both genders. He was interested also in ascertaining their discontinuation in sport at the age of 18-19 years. He observed that discontinuation of sports was best predicted from reactive negativism (extrinsically provoked hostile actions) and proactive negativism among males. For teens, psychological orientation in sport provides motivation to perform at different levels and also to discontinue performance in a certain sport if the motivation is not there to do it. Depending upon the motivational style of the individual, it appears the athlete can predispose themselves to achieve success in different sports according to whether or not their motivational style predisposes them to success. Psychological perceptions influence teen athletes to either perform better in their sport or to drop out from participation because of negative experiences or because they have motives to develop desires they have had to be involved in other activities.

Weiss and associates (1997) surveyed 183 children, participants in summer sports programs. A cluster analysis identified four distinct profiles: (1) younger, higher in competitive trait anxiety, strong preference for pre-game anxiety; (2) lower self-esteem, lower on pre-game anxiety; (3) higher self-esteem, lower on competitive trait anxiety; and (4) older, higher in competitive trait anxiety.

In a survey study by Fung and Fu (1995) of wheelchair athletes (150 finalists and 150 non-finalists in track, racing, swimming, and table tennis) it was found that athletes with differing performance levels possessed unique psychological characteristics. Finalists had lower levels of trait anxiety, tension, depression, anger, and confusion but had higher levels of vigour (sic), fatigue, and sense of commitment than non-finalists.

Ebbeck (1994) selected 115 male and 125 female community tennis players to survey, to analyze self-perception and motivational characteristics. She observed that age and skill were significantly related to possession of competitive trait anxiety. With increasing age females experienced less competitive trait anxiety. Those athletes with less skill also exhibited more competitive trait anxiety.

A study designed by Krane and Williams (1994), in which male and female high school and college track and field athletes completed the Competitive State Anxiety Inventory, revealed interesting findings. Male athletes reported lower somatic anxiety than female athletes. College athletes displayed lower cognitive and somatic anxiety than high school athletes.

Another study by Coen and Ogles (1993) examined characteristics of obligatory and non-obligatory runners. Questionnaire results disclosed that the former report higher levels of anxiety when not running. Both were significantly different on measures of trait anxiety.

An analysis of competitive trait anxiety in female soccer athletes was reported by Glenn and Horn (1993). Athletes who were rated high in leadership ability by their peers exhibited high levels of competitive trait anxiety.

Coping styles are another part of the athlete's psychological identity related to sport performance. Coping styles, or ways to deal with acute stressors in sport, help the athlete to control internal and external stress demands that challenge or go beyond the resources of the athlete. Different coping styles include approach and avoidance styles combined with problem-focused and emotion-focused coping strategies. Anshel (1996) notes the avoidance style is used, "with this externally controlled source of stress, because confronting the stressor would rarely improve the situation or the outcome in such circumstances (page 313)." With the approach style, dealing with

a source of pain is preferred to taking a chance on a more serious injury. The coping response helps the athlete to control unpleasant emotions and to establish psychological distancing of the performance stressor. Psychological distancing is established by confronting or avoiding the source of stress, separating the athlete from the stressor, and maintaining self-control. Anshel (1996) relates, "Coping successfully in sport involves regaining one's composure, establishing the proper mental set (the psychological readiness to respond to subsequent stimuli), and maintaining optimal arousal and concentration (page 312)."

Commitment Orientation--Includes terms or concepts such as attraction, commitment, entrapment, focus capacity, resistance to change orientation.

An insightful literature review and theoretical paper by Iwasaki and Havitz (1998) outlines a model of participants' behavioral loyalty. They maintain that involvement leads to psychological commitment which generates resistance to change resulting in behavioral loyalty.

Other authors have said that socialization and encouragement of youth athletes by parents, educators, and coaches creates psychological desire and incentive for successful athletic performance. Hoyle and Leff (1997) explain that, "parental support is associated with greater enjoyment of sport, more positive appraisal of performance outcomes and more positive appraisals of self-worth. Parental pressure, on the other hand, is associated with discontent (page 234)." Adult involvement can encourage or discourage the psychological self-concept of the youth athlete. When a youth athlete is under high pressure, it can pose a serious threat to his/her psychological well-being. Females experience higher levels of parental pressure which can make the situation even more precarious. When adults assist youth to establish a positive psychological environment, they help them to combat negativity and to create a positive atmosphere for increased self-esteem and better performance.

One investigator (Raedeke, 1997) examined athlete burnout from a commitment perspective. He studied 236 female and male age group swimmers. They completed a questionnaire that assessed determinants of commitment and burnout. He noted that “. . . numerous anecdotal accounts exist of athletes who became fed up with sport participation and stopped competing at what should have been the top of their careers (page 396).” The commitment perspective, as different from the stress perspective, clearly identifies specific psychological conditions of commitment that bring about either favorable performance or elevated stress. These conditions of commitment include athletes that are in enthusiastic, indifferent, obligated, and malcontented psychological states about sport performance. Enthusiastic athletes are the most committed; indifferent athletes are the least committed; and, obligated and malcontent athletes may be committed but for unhealthy reasons. Obligated and malcontented athletes have psychological characteristics of low personal control and high social constraints and are the most susceptible for sport entrapment. Some of the negative effects of reduced commitment, sport entrapment, and burnout are emotional exhaustion, depersonalization, and reduced personal accomplishment in sport performance. Raedeke (1997) concluded: “that athletes will not experience burnout unless they feel that they are missing out on other activities and life opportunities because of their sport involvement (page 413).”

In the study by Fung and Fu (1995) cited previously level of commitment was a major factor that differentiated athletic performance levels between wheelchair sport finalists and non-finalists. Finalists exhibited higher levels of commitment.

Competition Orientation--Includes terms or concepts such as anger, competitiveness, and positive pre-competitive and positive competitive affect.

Hellandsig (1998), cited previously, studied the effects of motivational predictors and high performance of teens and found that: "Competitiveness, win orientation and the importance of physical competence in sport, attributed to self and to sport mates, predicted high performance in all types of sport (page 27)." For teens, psychological orientation in sport provides motivation to perform at different levels and also to discontinue performance in a certain sport if the motivation is not there to do it. Depending upon the motivational style of the individual, it appears that the athlete can predispose themselves to achieve success in different sports according to whether or not their motivational style predisposes them to success.

The study of track, racing, swimming, and table tennis competitors referred to earlier (Fung and Fu, 1995) included an assessment of competitive anger. In comparing finalists versus non-finalists, it was found that the former had lower levels of anger in competition than did the latter.

Twenty-four wheelchair athletes became the subjects of a study by Henschen, Horvat, and Roswal (1992). The purpose of the study was to compare psychological characteristics between elite disabled athletes competing in the United States Wheelchair Basketball Paralympics Team Trials. The authors wanted to determine if psychological variables indicated differences between the group that was selected for the team ($n=9$) and those who were not ($n=15$). Another purpose was to determine if characteristics could be changed significantly prior to competition. A major finding was that, over time, team members became less critical of themselves and less anxious the closer they came to actual competition. Apparently, their attitudes about competition were changing over time.

A qualitative investigation into the flow experiences of elite figure skaters was conducted in order to gain greater insight into the nature of flow in sport. Jackson (1992) interviewed sixteen former U.S. National Champion figure skaters concerning factors associated with flow states during

competition. Those factors perceived as most important included among other things, positive pre-competitive and competitive affect (or feelings before and during competition). Three higher-order concepts were combined to form the theme of competitive affect: Being Relaxed, Controlling Anxiety, and Enjoying What One Was Doing. Many of the respondents emphasized the importance of maintaining balance among these dimensions.

Decisional Processing Capability--Includes terms or concepts such as decision-making and decisional processing.

The pioneering work of Coleman R. Griffith included theory-practice integration through applied research and eclectic focus, not just on psychological and emotional aspects of sport, but also on elements of perception, decision-making and movement control, and learning. Abernethy (1999) discussed the decision-making and movement factor and concluded that it was important in sports performance although it no longer occupies a central position within modern sport psychology. He recognized that there are two fundamentally different types of attentional processes (or decision-making) in learning and performance. One type is very conscious, deliberate, slow, attention-demanding and serial by nature. The other type which occurs below the conscious level is automatic, fast, inevitable, and parallel by nature. Importantly, these two processing types can interact and cause interference affects in task performance. Any applied intervention strategy which requires performers to deliberately attend to control processes which are normally automatic would appear to have the potential to interfere with performance.

Global Self Worth (Perception of)--Includes terms or concepts such as assertiveness, competence, confidence, independence, positive mental attitude, optimism, self-assurance, self-efficacy, self-esteem, and win orientation. Global Self-Worth has been defined as "a general measure of an individual's satisfaction with himself or herself as a person (Ebbeck, 1994, page 75)."

In reviewing the works of other investigators, Hellandsig (1998) concluded that: "the motive to achieve success in sports is believed to represent an athletes intrinsic motivation to approach a competitive situation (page 28)." Achievement motivation, in turn, is comprised of variables that contribute to a positive self-image, i.e. competitiveness, win orientation, and goal orientation.

Psychological perceptions of competence in self and others relate to forming attitudes about performance in sport. Weiss, Ebbeck and Horn (1997) note, "perceptions of competence have been found to powerfully influence emotions and motivate behavior (page 52)." In a specific sport, depending upon how they feel about their own and others' levels of competence, athletes evaluate the worth of their abilities and the worth of others' abilities related to their perceptions. Perceptions influence factors including competitive trait anxiety, general self-esteem, and perceived physical competence for sport achievement. Internal perceptions within individuals motivate them to perform to a certain standard and to act in a certain way toward external factors in the sport environment. Perceptions that are based upon self-referenced evaluation instead of comparison with others help athletes to have a more positive psychosocial development and a better ability to cope with any anxiety they may face in performance situations. How an individual perceives their competence and the competence of others has a large effect upon the development of attitudes that facilitate development and improvement in a specific sport.

Active participation by female adolescents in physical activity is associated with and dependent upon a positive sense of optimism. Promoting healthy psychological attitudes toward physical activity results in more satisfying sports participation for females, according to Bungum and Vincent (1997). They indicated that "It is apparent that physical activity needs to be promoted among female adolescents. There is a clear opportunity for physicians and other health professionals to be involved in this effort (page 120)."

Wittig and Schurr (1994), in studying psychological characteristics of female volleyball players, found that individuals with assertive, self-assured and independent attitudes were in a different conference than others, had higher values for success, but also had higher injury rates. Those suffering injuries, however, adhered to rehabilitation plans better than those athletes who were not positively self-assured.

Ebbeck (1994) examined the relationship of age and skill with self-perception of tennis participants. Those who reported higher global self-worth, performed better, perceived that they had better competence, perceived that they had better tennis salience, were older, and more skillful.

The study of athletes in flow or a qualitative analysis of flow states in elite figure skaters, was reviewed previously (Jackson, 1992). She produced conclusive evidence that factors perceived most important for getting into skating flow included, among other things, a positive mental attitude. Maintaining appropriate focus, physical readiness and unity with partner were also important variables, all more easily attained with a positive mental attitude. Conversely, factors which disrupted skating flow were physical problems/mistakes, inability to maintain focus, negative mental attitude and lack of audience response.

Goal Orientation--Includes terms or concepts such as achievement motivation, challenge motivational orientation, goals, goal setting and task and ego orientation.

A study cited previously (Hellandsig, 1998) concerning predictors of high performance and discontinuation in sports of talented teenagers, examined three times over a three year period, produced insight into the influence of goal setting. High scores on goal orientation and importance of friendship attributed to self, best predicted high performance in endurance sports. Medium range scores for win orientation in previous years also predicted high performance in risk and safe sports.

One other investigation had some interesting results. Stein, Kimiecik, Daniels and Jackson (1995) conducted three studies of athletes in different sports. They compared students “in flow” versus students in “boredom, apathy or anxiety states.” They found that in a learning environment greater enjoyment, satisfaction, concentration, and control were experienced by “flow” students than “boredom, apathy or anxiety” students. However, they concluded that the psychological antecedents of flow for sports participation remain unidentified, as neither goals, competence, nor confidence predicted the flow experience.

Contrary to Stein and associates’ findings, accomplished sports performance is often associated with an individual’s goal setting nature and goal orientation. Weinberg’s (1994) successful synthesis of previous studies demonstrated this. He said: “To know how a person will perform, it is imperative to know what personal goal each individual sets in response to the goal that was assigned (page 473).” Developing personal goals provides the individual a standard for performance and an ability to control negative mental influences if the person is able to persist in achieving the goals. Similarly, coaches are usually able to relate better to individual players and motivate him/her more effectively if they understand the individual’s goals. Goal orientations create internal mental processes that drive individuals to make decisions. Comprehending more about how much an athlete’s ego is tied up in sport performance or how much they relate their performance to personal mastery is also critical for personal growth. Weinberg (1994) points out, “unrealistic goals should be avoided because if goals are so difficult that this results in continuing failure, motivation will drop and subsequent performance will deteriorate (page 471).”

Imagery or Visualization Capability--Includes terms or concepts such as imagery, conceptual knowledge, experience, and visualization.

Ludwig (1996), in a literature review and synthesis of others' conclusions, notes that some of the common requests that athletes utilizing the services of sport psychology are concerned with, ". . . are visualization, arousal control, confidence, assertiveness and aggression training, burnout avoidance, concentration, motivation, focusing and refocusing, and coping with obstacles (page 32)." The athlete and coach are concerned with being able to direct and change psychological processes that affect performance and manipulate them towards success and away from failure. Individual performances are studied, researched, and videotaped as images to reflect upon psychological characteristics that can be manipulated by athletes and coaches for differences in performance effect.

A study of novice dancers was accomplished by Laugier and Cadopi (1996). They analyzed the representations formed by adult novices to dance who had learned a sequence of movements by watching a video model. Two sequences, one composed of concrete and familiar movements and the other of more abstract movements, were shown to thirty-two subjects. In a first experiment the subjects correctly represented the form and temporal dimensions of movement, whatever the nature of movements learned. A second experiment showed that concreteness (image specificity) had a facilitating effect on memory recall and the quality of motor performance. Psychological representations formed by the athlete influence the nature and quality of the performance. The way movements are represented spatially and temporally in the mind creates a goal orientation for performance. Laugier and Cadopi (1996) note that, "mental representations formed by individuals are functional. Their content and structure vary in terms of the individual's level of cognitive development and degree of expertise (page 99)."

Sixty-seven soccer players, divided into six groups according to their skill levels and ages, were studied by Lerda, Garzunel, and Therme (1996). The methodological approach consisted of

varying the constraints (the dimensions of playing areas) of a standardized one-to-one duel task in order to reproduce the spatial conditions encountered in real play, and to evaluate the ability of subjects of different skill levels to adapt to these variations. The experts or more skilled players were better at adapting to environmental changes (variations in dimensions of playing areas or spatial conditions) than non-experts or less-skilled players.

Visual demonstration (imagery) and knowledge of performance (KP) were investigated by Magill and Schoenfelder-Zohdi (1996). They provided forty-eight female subjects either an expert model demonstration or detailed verbal instructions of a rhythmic gymnastics sports skill, and were given either KP or no KP. They found that subjects who observed the model needed less KP about body and limb coordination features of the skill than subjects who did not observe the model, but needed more KP about characteristics of handling the rope. Their results support the hypothesis that observing a model provides information that facilitates the development of appropriate coordination patterns required to perform a complex motor skill. Representation in the mind is aided by memories of practice and performance formed by the athlete. The athlete receiving memory feedback, visual observation, or knowledge of performance is enabled to affect a change in performance. The psychological memories created by practice and performance work to create an internal representation of correct performance and create intuitive knowledge to change the characteristics of the performance. “. . . The primary role of augmented feedback during learning is to aid the development of a memory representation of correct performance (Magill and Schoenfelder-Zohdi, 1996, page 17).”

Player characteristics including psychological experience with the sport and conceptual knowledge of the sport, are other critical factors for sport performance. This observation was

reinforced in an interesting study by McPherson (1993) of twelve experts, their coach, and twelve novices in a batting preparation scenario. The study examined how the conceptual knowledge concerning batting preparation develops with playing experience. The participants viewed a half-inning of a videotaped collegiate baseball game and assumed the role of the fourth batter. It became evident in comparing experts from novices that the former's rules were more tactical, refined and associated than were the latter. Experts generated self-regulatory strategies to update, check and modify their predictions of pitcher characteristics. Expert performers' conceptual knowledge underlies decision making in sports situations. Concludes Mcpherson (1993): "In sport performance, the knowledge underlying response selection has been found to be as critical a component as the ability to execute a response (page 304)."

Psychological imagery is a crucial element for adding to the effectiveness of sports performance. Murphy (1990) reviewed several previous research studies concerning the use of imagery in sport psychology as a psyching-up method. He made some significant observations: successful athletes may be more likely than their counterparts to engage in certain mental processes such as dreaming about their events, using internal imagery, and using imagery as a problem-solving device. Many use an imaginal performance rehearsal strategy prior to performance that has been shown to be an effective means of enhancing performance. Murphy (1990) writes, "where hundredths of a second or tenths of an inch often separate the champions from the also-rans, the extra edge which proper mental preparation can give an athlete is a precious and much sought after commodity (page 153)."

Imagery refers specifically to techniques for imagining mentally the performance and completion of an athletic skill. Psychological characteristics based upon mental practice help the

athlete to enhance his or her ability to acquire sports skills and improve performance of the skills that they have learned. The development of gross and fine motor skills is essential to enhancing performance. Learning to imagine the correct performance of the sport skill is a necessity for successful performance. The athlete must imagine that right mental practice makes perfect skill learning. By rehearsing sports skills the athlete can strengthen his or her ability to internalize the performance. Murphy (1994) concludes, "that imagery is a basic cognitive function in humans, and is central to motor skill acquisition and execution (page 493)."

Interestingly a later literature review summary was also published by Murphy (1994). He analyzed four general categories: (1) Mental Practice, (2) Pre-competition Imagery, (3) Comparisons of Successful and Unsuccessful Competitors, and (4) Mediating Variables. He concluded that Mental Practice research has produced equivocal results, and that ". . .the Mental Practice Model for research into imagery processes in sports is non-productive (page 486)."

Participation/Involvement (Perception of)--Includes terms or concepts such as involvement and participation (in sports).

From a literature review and synthesis of others' study conclusions, Iwasaki and Havitz (1998) concluded that individuals go through psychological processes to become loyal sport participants. The processes include: (1) formation of high levels of involvement in activity; (2) development of psychological commitment to a brand (a brand name piece of equipment and/or a type of sport); (3) maintenance of strong attitudes toward resistance to changing the brand; and, (4) increased loyalty. The individual athlete's own values and beliefs affect commitment, involvement, and loyalty to sport performance. Iwasaki and Havitz (1998) submit that, "developmental processes driven by levels of involvement and psychological commitment explain participants behavioral loyalty (page 257)."

Eight hundred and fifty-two young high school women, 14-18 years of age, were studied by Bungum and Vincent (1997) to assess their extent of physical activity and the factors that influenced it. Overall, nurture from biological fathers and active participation in organized sports were associated with increased physical activity. Viewing two or more hours of television per night negatively influenced physical activity.

Perfection (Achievement) Orientation--Includes terms or concepts such as perfectionism and self-regulatory strategies.

The perfectionistic attitude of the obligatory athlete demonstrates how personality characteristics are important to and related to athletic performance. The perfectionistic personality characteristics of the obligatory athlete cause them to fear performance failures and to feel that the performance must be flawless or it is worthless. Coen and Ogles (1993) explain that obligatory athletes are, "overly concerned about mistakes in performance. This overconcern leads them to strive for goals because of a fear of failure rather than because of a need for achievement. Neurotic perfectionists also have a tendency to doubt the quality of their own performance (page 343)." The characteristics of the obligatory athlete are often unhealthy and inappropriate related to performance control. They tend to be associated with lack of emotional control, high anxiety, and an obsessive-compulsive nature influencing performance negatively. The obligatory athlete uses rituals and habits of physical activity to define his/her own identity.

In the study of the analysis of baseball players' batting preparation previously referenced (McPherson, 1993), the author disclosed some perfectionistic tendencies of expert players versus novice players. He noted that experts' mental rules of batting responsiveness were more tactical, refined and associated compared to novices' rules. Experts generated self-regulatory strategies to update, check, and modify their predictions of pitcher characteristics.

Physical Competence (Perception of)--Includes terms of concepts such as competence, physical competence, self-efficacy, self-esteem, self-perception, and unity with partner.

As noted earlier, in an analysis of sports performance of 352 talented teenage athletes at three different times over a three year period (Hellandsig, 1998), among other factors, importance of physical competence predicted high performance in all types of sports.

The cluster analysis of 183 children's self-perceptions and sources of physical competence information, also referenced earlier, revealed one category of children who were younger, higher in anxiety, and lower in perceived physical competence than older children (Weiss, *et al.*, 1997) . They also had a strong preference for pre-game anxiety. Their preference for sources of physical competence information was not for social comparison/evaluation criteria.

Psychological perceptions of competence in self and others relate to forming attitudes and achieving at varying levels during sports performance. Weiss, Ebbeck and Horn (1997) note, "perceptions of competence have been found to powerfully influence emotions and motivate behavior (page 52)." In a specific sport, athletes evaluate the worth of their abilities and the worth of others' abilities related to their perceptions. How an individual perceives his/her competence and the competence of others for achievement in sport has a significant effect upon the creation of attitudes that facilitate development and improvement in a specific sport performance.

Ebbeck (1994) studied self-perception and motivational characteristics of 240 tennis participants. She was interested in determining whether or not psychosocial variables such as perceived tennis competence, global self-worth, etc., were related to age and skill levels. She concluded that both age and skill levels were significantly related to the psychosocial variables studied. The concept of perceived tennis competence is a closely related indicator of perceived physical competence.

In 1993, Glenn and Horn investigated psychological and personal predictors of leadership behavior in 106 female soccer athletes. One of the important characteristics studied was perception of soccer competence (PSC). They found that athletes who were high in PSC rated themselves higher in leadership ability than did athletes who scored lower in PSC. Also, coaches' ratings of athletes' leadership tendencies were associated primarily with the players' actual skill competence.

In female athletes the psychological predictors of leadership are rated differently by coaches, peers, and self-rating. Glenn and Horn (1993) point out that while they are viewed differently, "that certain psychological and personal characteristics can be used to identify peer group leaders (page 32)." Self-ratings of leadership predictors indicate that individuals rate as important the need for androgynous characteristics that combine masculine and feminine qualities. Coaches rate leadership more on ability and are often inaccurate about rating player characteristics as they predict leadership.

The study by Jackson (1992) already referred to included a qualitative investigation of flow states in elite figure skaters. Sixteen subjects were studied, including two singles, three teams of two, and four pairs of two. Among factors perceived as most important for getting into skating flow, physical readiness was perceived as most important. Among factors which disrupted skating flow, physical problems/mistakes were considered important. Independent of physical prowess the skaters' mental perception of physical competence played a role in getting into skating flow.

Psychological characteristics like the state of mind of the individual are important to creating flow during an athletic performance. Jackson (1992) reports, "to help an athlete get into flow, the physical aspect of one's training may need to be in place, a positive psychological state may be necessary, and environmental factors may need to be right for the athlete (page 178)." The antecedents or states of mind that create flow in athletic performance are developed as the individual

perceives a context as optimal for performance because of necessary concomitant psychological characteristics. Stein, Kimiecik, Daniels and Jackson (1995) tell us, "Flow is a psychological state that typically occurs when a person perceives a balance between the challenges associated with a situation and his or her capabilities to meet these demands (page 125)."

Sex Role/Gender Orientation--Includes terms or concepts such as gender, femininity, masculinity, and sex role.

One analysis by Ludwig (1996) of others' research illustrates that perceptual social and gender-role issues make women more receptive to psychological services. Ludwig says it is clear that attention-control and anxiety dominate women's psychological needs. Hence, they often request various counseling services. They often utilize the services of sport psychology including, "... visualization, arousal control, confidence, assertiveness and aggression training, burnout avoidance, concentration, motivation, focusing and refocusing, and coping with obstacles (page 32)." The athlete and coach are concerned with being able to direct and change psychological processes that affect performance and manipulate the processes towards success and away from failure. Individual performances are studied, researched, and videotaped to reflect upon psychological characteristics that can be manipulated by athletes and coaches for differences in performance effect.

A Krane and William's study of 216 male and female high school and college track and field athletes revealed some interesting gender-related findings. Male athletes reported lower somatic anxiety and higher self-confidence than female athletes. College male non-placers displayed the lowest levels of cognitive anxiety while high school male non-placers displayed the highest levels.

Glenn and Horn (1993) looked at psychological and personal predictors of leadership behavior in female soccer athletes. In studying the sex-role orientation of their subjects, i.e., perceptions of

masculinity or femininity, their findings were conclusive. Athletes who had androgynous characteristics that combined femininity and masculinity rated themselves higher in leadership ability than did athletes who scored low on these same characteristics. Glenn and Horn (1993) point out that while they are viewed differently, "that certain psychological and personal characteristics can be used to identify peer group leaders (page 32)."

Summary--In this section literature was summarized in which previous investigators examined the relationship of several psychological characteristics or factors in relation to athletic performance. The various factors reflected different levels of abstraction including the following: aggression orientation; anxiety/negativism (perception of); commitment orientation; competition orientation; decisional processing capability; global self-worth (perception of); goal orientation; imagery or visualization capability; participation/involvement (perception of); perfection (achievement) orientation; physical competence (perception of); and, sex role/gender orientation.

Varying degrees of relationships were found between several of the characteristics and athletic performance. Those relationships and the conclusions derived therefrom will be delineated in a later section of the paper.

B. Social-Psychological and/or Sociological Characteristics Previously Studied in Relationship to Athletic Performance

Social-Psychological Perspectives--Includes terms or concepts such as parental support and socialization experiences.

Socialization and encouragement of youth athletes by parents, educators, and coaches creates intrinsic desire and incentive for successful athletic performance. Youth involvement in athletics is

often a product of greater athletic participation and encouragement by parents. Adult role models are important to youth. Hoyle and Leff (1997) explain that, "parental support is associated with greater enjoyment of sport, more positive appraisal of performance outcomes, and more positive appraisals of self-worth. Parental pressure, on the other hand, is associated with discontent (page 234)."

Adult involvement can encourage or discourage the mental self-concept of the youth athlete. The development of a positive self-concept is contingent upon positive parental and peer reinforcement. When adults assist youth to establish a positive psychological environment they help them to combat negativity and to create positive self-esteem which nurtures better athletic performance.

Brustad (1992) also commented on the importance of positive socialization experiences on children. Relying upon the work of previous investigators, he examined the impact of socialization influences in shaping cognitions widely regarded to influence children's sport behavior. He paid special attention to related research in academic settings that identifies the influence of parental socialization patterns upon children's self-perception characteristics, orientations towards achievement and patterns of motivated behavior. Said he: "Children's perceptions regarding their own math ability, and their perceptions regarding the difficulty and level of effort required for math, were more strongly related to their parents beliefs than to their own demonstrated level of ability (page 65)." Self-perceptions in children are molded by adults and educators during their early years and can influence their growth and development. Brustad (1992) illuminates further, "children establish relatively stable ability perceptions in the various achievement domains during the early elementary school years (page 64)."

Demographic Characteristics--Includes terms or concepts such as age and ethnic group.

Psychological perceptions of competence in self and others relate to forming attitudes about performance in sport. Although this literature review was focused primarily on an examination of psychological characteristics in relationship to athletic performance, two of the articles found concentrated on demographic characteristics. It was important to include a summary of these because their findings are interesting in light of the study topic. In the first article by Bungum and Vincent (1997), in which they studied determinants of physical activity among 852 female adolescents, they found that ethnic group and age were significant influences on physical activity. Caucasians were found to be more active than non-Caucasians, and younger persons were found to be more active than older athletes.

Physical participation by female adolescents in physical activity is associated with, and dependent upon healthy psychological characteristics developed through positive socialization experiences. Bungum and Vincent (1997) tell us, "It is apparent that physical activity needs to be promoted among female adolescents. There is a clear opportunity for physicians and other health professionals to be involved in this effort (page 120)." The psychological side of wanting to be involved in physical activity is nurtured when healthy activity patterns are established early in life. The encouragement of responsible professionals and community citizens promotes healthy attitudes toward sport and involvement in physical activity. The promotion of healthy interest in physical activity through school and community programs improves female participation in physical activity.

In the second article by Weiss, Ebbeck, and Horn (1997), a study of 183 children of both genders, age was also found to be a contributing factor to the identification of clusters of children whose self-perceptions were contingent upon either social comparison/evaluation or self-reference as preferred sources of competence information.

Summary--In this section, literature was summarized in which previous investigators examined the relationship of social-psychological and some sociological characteristics in relation to athletic performance. The former included the following social-psychological perspectives: daily hassles, life stress, parental support, and socialization experiences. The latter included the following demographic characteristics: age and ethnicity.

The authors found some evidence of the existence of relationships between both social-psychological and sociological characteristics. This evidence will be discussed in a later section of the paper.

C. Group (Team) Psychological Attributes
Previously Studied in Relationship to Athletic Performance

Aggression Orientation--Includes terms or concepts such as aggressiveness and vigour (sic).

It was mentioned earlier that Stephens and Bredemeier (1996) studied aggressiveness or vigour (sic) as it relates to athletic performance. They administered a test battery to 212 soccer players following a regularly scheduled league game. One of their important findings pertaining to team dynamics was that players who described themselves as more likely to aggress against an opponent, also were more likely to identify a larger number of teammates who would aggress in a similar situation. Their results suggest that young athletes' aggressive behavior is related to their teams' "moral atmosphere," including team aggressive norms, and players' perceptions of these team norms. The term "moral atmosphere" refers to the environment in which moral action usually takes place, in this case in a social or group (team) context, and that context has a profound influence on the moral decision-making of individuals.

Commitment Orientation--Includes terms or concepts such as attraction, commitment, entrapment, focus capacity, and resistance to change orientation.

Teammate social support in a psychologically cooperative atmosphere is an essential contributor to successful athletic performance. A collaborative climate provides an atmosphere for mutually beneficial relationships to be formed among team members. A proactive working environment stimulates athletes to develop a shared commitment for performance success. Rosenfeld and Richman (1997) reviewed earlier literature and synthesized the conclusions. They stated: "Members of a team must have a reason for working together, and they need to be interdependent, that is, to recognize their need for each others' experiences, abilities, and commitment in order to accomplish group goals (page 140)." Social support aids the psychological, physical, and emotional well-being of team athletes and molds and develops cooperation, commitment, and enhanced performance success. A sense of unity among team members may also be a contributor to successful athletic performance (Jackson, 1992). In a study of factors contributing to flow states in elite figure skaters she found that two of the important factors perceived as most important for getting into skating flow were having a positive mental attitude and unity with partner. Both members of the partnership must be fully committed to create the necessary flow state for having a successful performance.

Goal Orientation--Includes terms or concepts such as achievement motivation, challenge motivational orientation, goals, goal setting, and task and ego orientation.

Psychological factors and sport behavior include an individual's goal setting nature and goal orientation. "To know how a person will perform, it is imperative to know what personal goal each individual sets in response to the goal that was assigned (Weinberg, 1994, page 473)." Through

knowing individual team members' goals, coaches are usually able to grasp information related to the individual and then motivate the team more effectively if they understand individuals' goals. The goal orientation of the individual creates an internal environment that drives the individual to make decisions. The goal orientation operates depending on whether the athlete has a task or ego orientation toward goals. Comprehending more about how much an athlete's ego is tied up in sport performance or how much they relate their performance to personal mastery is critical for personal growth. The athlete can learn about themselves, and the coach can learn about the individual and group goal characteristics of the team. The coach can help the athletes to create and develop group goals that meet athletes' needs and are progressive.

In developing goals athletes and coaches should be aware of unrealistic expectations. Weinberg (1994) points out, "unrealistic goals should be avoided because if goals are so difficult that this results in continuing failure, motivation will drop and subsequent performance will deteriorate (page 471)."

Human Resource Capacities--This is a term or a concept of a more general level of abstraction that seems to encompass a lot of the characteristics identified in various categories outlined above.

Essentially, the value of the athlete as their own psychological resource as a human being is pre-eminent. Their own characteristics empower them to achieve successful athletic performance. Wright, Smart and McMahan (1995) examined the relationships among strategy, human resources, and performance among National Collegiate Athletic Association (NCAA) basketball teams (n=143). Results based on survey data and a wisely used performance rating indicated that coaches' preferred strategies influenced the characteristics that they looked for in recruits. Also, teams implementing a strategy different from a coach's preferred strategy performed less well than those implementing

the coach's preferred strategy. Human resource capacities, the decisive factor, interacted with the coach's strategy in affecting team performance. The authors point out, "It appears that a coach who is deciding whether to choose between a recruit whose skills match his own strategy and a phenomenally talented recruit whose skills do not match his strategy might be better served by choosing the latter (page 1068)." The more decisive factor of the human resources of the athlete interacts with the strategy of the coach to determine what will be enacted during the performance. While the strategy of the coach influences the type of players sought out as recruits, and the team structure, the athlete determines how well he/she will control his/her own resources for performance, and how well he/she is able to play with the athletes assembled and adapt to the team environment.

Human resources of the athlete are ultimately what matters and are more decisive in predicting outcome than the coach's strategy. In the player-coach relationship, the player can add to, can compensate for, can overrule, and is the decisive factor in control of the athletic performance. If the player is determined to improve performance and not to fail, his or her determination and willpower is the decisive factor in the performance. For example, to demonstrate that the human resources of the athlete are ultimately what matters, Wright, et al. (1995), in analyzing a possible draft of Michael Jordan by the Portland Trailblazers related: "Michael Jordan, an extremely talented player was not ideally suited to either the guard or forward positions, neither of which was a great need for Portland. The Trailblazers chose (Sam) Bowie (a center), allowing Jordan to be drafted by the Chicago Bulls. Jordan subsequently led the Bulls to three straight world championships (page 1068)." Michael Jordan demonstrated clearly that individuals are the decisive factor on the outcome of team performance. Obviously, Jordan was a team player, but he was able to individually impose his own will by hitting several critical shots and making various defensive plays to influence the outcome of several important basketball games.

Historically, teams learn from experience and gain foresight about selecting certain athletes with certain characteristics deemed best to contribute to the future of their team. Because the human resources of the athlete are the decisive factor in performance, a system and set of psychological strategies that does not utilize the best athletes available and the strengths of its existing athletes will be less enabled to achieve success.

Team athletic performance is directly affected by the collective strategy utilized by the athlete, team members, and the coach. In basketball, "teams represent an extreme of labor intensity. A team's success relies almost entirely upon its people (both coaches and players) (Wright, Smart and McMahan, 1995, page 1058)." Athletic performance is affected by psychological strategy exercised by each of the team members and commissioned by the coach to the athletes. The athletes internally influence the individual strategy, and the coach and athletes externally influence the team strategy the athletes can choose to employ. The athletes, however, are the decisive factor in individual performance characteristics as they can contribute to a whole team outcome or a singular event. The coach directly and indirectly influences the players' performance by setting up coaching strategy to bring out the best in his/her players. The coach's teaching can contribute to what the players adopt as strategy. The decisions of the individual athletes and the strategy of the coach, and their commissions or omissions in teaching, decision-making, and choosing strategies, contribute to the total psyche of the team and the team's success or failure in performance.

Individual athletes and coaches possess unique psychological characteristics that when brought together create a team pulse or group feeling about performance. Utilizing the diverse leadership qualities existent in individual team members is an important part of being successful in relating to other athletes and performing well as a team. Wright, Smart and McMahan (1995) point out that,

“the one thing they would find it impossible to equal very easily is the spirit of our people and the attitude they manifest (page 1069).” Ideas of what constitutes the team psychological makeup provides an understanding for utilizing current psychological qualities and figuring out how to improve upon the needed attributes of the team for sport performance. It is helpful to know that specific psychological characteristics are possessed by the athletes, and can be tapped by team members to lead to and create successful performance in key performance situations.

Psychological and motivational dimensions of the sociomoral aspects of the team and team performance behavior have a profound effect upon the moral atmosphere of the team and the performance of the team as seen in its individual athletes. Stephens and Bredemeier (1996) relate, “Future research directions should include direct assessment of coach’s and parents’ own motivational orientation as well as their goal orientation regarding the player (page 170).” The modeling and shaping of behavior that occur in the team setting add to the cumulative (individual, teammate, coach, parent, educator, society) moral environment and the unique psychological mindset that exists in each athlete. The athlete consolidates the moral atmosphere of the team into his or her own psyche and acts it out in the team context. The performance of the team members is influenced by the behavioral guides inherent in the moral atmosphere of the team and the rules of the particular sport that the team is playing. Each particular sport, team, and community cultivate their own distinctive moral atmosphere for decisions in unique sport situations creating particular performance behavior.

Imagery or Visualization Capability--Includes terms or concepts such as imagery, conceptual knowledge, experience and visualization.

In team sports, a player's skill level is reflected by his/her ability to perceive and quickly adapt to changes in the environment. Lerda, Garzunel, and Therme (1996) hypothesized that in team sports, the superiority of experts at adapting to changes in the environment is due to schematic mental structures by means of which they liken the current situation to an isomorphic situation already encountered. To confirm their hypothesis, they included 67 male subjects (soccer players) in an experiment. It consisted of varying the constraints (the dimensions of the playing areas) of a standardized one-to-one duel task in order to reproduce the spatial conditions encountered in real play, and to evaluate the ability of subjects of different skill levels to adapt to these variations. The investigators found that the experts were better at adapting to the modifications than the non-experts. This finding seemed to demonstrate the existence of schemata that direct information processing towards the relevant characteristics of the situation. Such schemata are expectation systems containing knowledge about the invariants and variants of familiar situations.

Psychological and cognitive strategies are used to direct decision making during athletic performance situations. Focusing on team sports, the perceptual abilities and the ability to adapt are crucial to effective performance within a team sport situation. Lerda, Garzunel and Therme (1996) comment, "The greater adaptation capacities of experts may be explained by their acquisition of more elaborate schemata which allow them to draw analogies between the current task and a class of situations previously stored in memory" (page 134). This so-called analogic transfer ability enables the athlete to make a quicker decision in highly intense competition. As part of a team sport, the variables encountered by the athlete are increased and more pressures are placed upon the individual during the timespan of the performance. Psychological and cognitive strategies affect the quality of the performance and the decision-making strategies employed by the individual athlete in the context of the group performance.

Summary--This exploratory literature review had as one of its objectives an analysis of group (team) psychological attributes previously studied in relationship to athletic performance. The preceding section contained a discussion of these types of research articles. Included were studies referring to the following group or team attributes: aggression orientation, commitment orientation, goal orientation, human resource capacities, and imagery or visualization capability.

The authors of these studies produced convincing evidence of a relationship between all of these characteristics and athletic performance at the group (team) level.

V. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

In this section the evidence gleaned from the literature review is summarized. There is substantial evidence for relationships among some of the variables, but little evidence for others. The conclusions are based upon a synthesis of the evidence presented in the findings of several previous scientific investigations, and other authors' literature review summaries. The conclusions are presented according to the characteristic categories as previously outlined.

1. Aggression orientation: There is some evidence of a relationship between aggression orientation and athletic performance.

One article noted that aggressive players relied more on their own moral principles than on the norms or expectations of their family, social group, team, or society. There is also evidence that finalists in wheelchair sports competition were more vigorous than non-finalists.

2. Anxiety/Negativism (Perception of): There is substantial empirical evidence of the influence of this characteristic on athletic performance.

In one study discontinuation of sports was best predicted from extrinsically provoked hostile actions (reactive negativism) and proactive negativism among teenage male athletes. In other words they needed positive reinforcement or encouragement to continue in sports participation. In a second study of children, participants in summer sports programs, at least two clusters exhibited high competitive trait anxiety. In a third study, again of wheelchair athletes, finalists had lower levels of trait anxiety than non-finalists. In a fourth study of community tennis players, the older participants experienced less competitive trait anxiety, and those with less skill exhibited more competitive trait anxiety. In a fifth study of high school

and college track and field athletes, male athletes had lower somatic anxiety than female athletes, and college athletes had lower cognitive and somatic anxiety than high school athletes. In a sixth study of obligatory and non-obligatory runners, the former reported higher levels of anxiety when not running, and both were significantly different on measures of trait anxiety. In a seventh study of female soccer athletes, those who were rated high in leadership ability by their peers had high levels of competitive trait anxiety.

3. Commitment Orientation: There is some empirical evidence that commitment orientation is related to athletic performance.

An insightful theoretical paper contained a model of participants' behavioral loyalty, i.e., involvement leads to psychological commitment which generates resistance to change resulting in behavioral loyalty. A study of socialization patterns (encouragement of youth athletes by parents, educators, and coaches) demonstrated that support from significant others was associated with greater commitment, enjoyment, more positive outcomes, and positive appraisals of self-worth. Another study of athlete burnout among swimmers disclosed that those who remain enthusiastic are most committed, have higher personal control, and lower social constraints. A fourth study found that level of commitment was a major factor that differentiated athletic performance levels between wheelchair sports finalists and non-finalists. Finalists exhibited higher levels of commitment.

4. Competition Orientation: There is some evidence that a competitive orientation is related to athletic performance.

One study concluded that competitiveness or win orientation predicted high performance in some types of sport. A second study indicated that over time wheelchair

athletes became less critical of themselves the closer they came to actual competition. A third study of the flow experiences of elite figure skaters revealed that those factors perceived as most important in terms of contributing to actual performance were positive pre-competitive and competitive affect, or feelings before and during competition.

5. Decisional Processing Capability: There was some empirical evidence of a relationship of this characteristic with athletic performance.

There was only one theoretical paper that addressed the topic. In that paper the author emphasized that there are two fundamentally different types of decision-making that are relevant to athletic performance. One type is very conscious, deliberate, and slow. The other type which occurs at the subconscious level is automatic, fast, and inevitable.

6. Global Self-Worth (Perception of): There is substantial empirical evidence that this characteristic is related to athletic performance.

From synthesis of a literature study, one author concluded that achievement is a product of positive self-image. In a second literature summary other authors observed that perceptions of competence powerfully influence emotions and motivate behavior. In a scientific study of adolescent female athletes, active physical activity was associated with a positive sense of optimism. In a fourth study of female volleyball players, it was found that individuals with assertive, self-assured and independent attitudes were in a different athletic conference, had higher success values, but had higher injury rates than their counterparts. An investigation of the self-perception of tennis participants disclosed that those who reported higher global self-worth, performed better, perceived that they had better competence and tennis salience, and were older and more skillful. Another study of flow states in elite figure

skaters produced conclusive evidence that a positive mental attitude was a major contributor to a successful flow performance. It pointed out that a factor which disrupted skating flow was a negative mental attitude.

7. Goal Orientation: There is some empirical evidence that goal orientation is associated with athletic performance.

Predictors of high performance and discontinuation in sports among talented teenagers were assessed. High scores on goal orientation and importance of friendship attributed to self, best predicted high performance in endurance sports. Another investigation which included three studies of athletes in different sports showed, that in a learning environment, greater enjoyment, satisfaction, concentration, and control was experienced by "flow" students than "boredom, apathy or anxiety students." The authors concluded that goals did not predict the flow experience. In contrast, another synthesis of previous studies led to the conclusion that the development of personal goals provides athletes with a standard for performance and an ability to control negative mental influences, if the person is able to persist in achieving the goals.

8. Imagery or Visualization Capability: There appears to be substantial empirical evidence that imagery or visualization capability is related to athletic performance.

One article, a synthesis of the literature, notes that some common requests from female athletes who request sport psychology counseling, include visualization, concentration, focusing, and refocusing skills. A study of novice dancers produced evidence that concreteness (image specificity) had a facilitating effect on memory recall and the quality of motor performance. Adaptations to environmental changes were studied with soccer player

subjects. Experts or more skilled players were better at adapting to environmental changes (variations in dimensions of playing areas or spatial conditions) than non-experts or less-skilled players. Visual demonstration (imagery) and knowledge of performance as psychological characteristics were examined with a group of rhythmic gymnasts. The results supported the hypothesis that observing a model provided information that facilitated the development of appropriate coordination patterns required to perform a complex motor skill. Player characteristics, including experience with sport and conceptual knowledge are other critical factors in sports performance. This observation was reinforced in a study of baseball players preparing for batting in an experimental scenario. Experts were more tactical and refined. They generated self-regulatory strategies to update, check and modify their predictions of pitcher characteristics. Another author, in a first published literature review article, concluded that successful athletes may be more likely than non-successful athletes to engage in certain mental processes such as dreaming about their events, using internal imagery, and using imagery as a problem-solving device. In another literature review paper published later, the same author presented contradictory findings concluding that "Mental Practice" research had produced equivocal results, and that the "Mental Practice Model" for research into imagery processes in sports is non-productive.

9. Participation/Involvement (Perception of): There was some empirical evidence for a relationship of this characteristic with athletic performance.

One theoretical paper outlined a model that individuals go through to become loyal participants, i.e., form high levels of involvement, develop psychological commitment to a brand, maintain strong attitudes toward resistance to changing the brand, and remain loyal to

the commitment. A scientifically based study of young high school women revealed that active participation in sports was associated with increased physical activity and nurturing from biological fathers.

10. Perfection (Achievement) Orientation: There is some empirical evidence of a relationship with this characteristic and athletic performance.

Some authors suggested that perfectionistic personality characteristics of obligatory athletes cause them to fear performance failures and to feel that the performance must be flawless or it is worthless. An analysis of baseball players' batting preparation produced some evidence that expert players were more polished or refined in terms of generating self-regulatory strategies to update, check and modify their predictions of pitcher characteristics.

11. Physical Competence (Perception of): There is substantial empirical evidence that perceptions of physical competence influence athletic performance.

An analysis of teenage athletes at three different intervals over a three-year period, leading up to their continuation or discontinuation in sports, showed that perceptions of positive physical competence predicted high performance and duration in all types of sports. A second study of children's self-perceptions and sources of physical competence information resulted in the identification of a cluster who were younger, higher in anxiety and lower in perceived physical competence than older children. Though indirectly related to this concept, perceived tennis competence was analyzed in a group of tennis players. Both age and skill levels were related to perceived physical competence. The leadership behavior in female soccer athletes was studied and reported in yet another article. Athletes who were high in perceived soccer competence also rated themselves higher in leadership ability than their

counterparts. A fifth study involving an analysis of flow states in elite figure studies demonstrated clearly that physical readiness or perceived physical competence was an important contributor to getting into the flow. Other authors reinforced this finding in concluding that to help an athlete get in flow, the physical aspects of one's training may need to be in place and there must be a balance between situational challenges and a person's capabilities to meet the challenges.

12. Sex Role/Gender Orientation: There is some empirical evidence of a relationship between sex role and/or gender orientation and athletic performance.

One analysis illustrated that perceptual social and gender-role issues made women more receptive to psychological services, including attention-control and anxiety. A second study of male and female high school and college track and field athletes concluded that male athletes had lower somatic anxiety and higher self-confidence than female athletes. Moreover, college male non-placers displayed the lowest levels of cognitive anxiety while high-school male non-placers displayed the highest levels. Looking at psychological and personal predictors of leadership behavior in female soccer athletes, the authors in another study found that athletes who were high in femininity and masculinity and/or androgynous characteristics rated themselves higher in leadership ability than did athletes who scored lower on these same characteristics.

13. Social-Psychological Perspectives: There was some empirical evidence for a relationship between social-psychological perspectives and athletic performance.

Although this concept does not include pure psychological constructs, it was studied in relation to athletic performance. Some authors contend that adult role models are important

to positive youth development of those attributes that will result in successful athletic experiences. Another author, relying upon the work of previous investigators, examined the impact of socialization influences in shaping cognitions widely regarded to influence children's sport behavior. He observed that self-perceptions in children are molded by adults and educators during the early or formulative years.

14. Demographic Characteristics: There was some empirical evidence of a relationship between demographic characteristics and athletic performance.

Two articles were found pertaining to demographic (social) characteristics. They were included to demonstrate that there is a lot of diversity in the types of factors and types of athletes that have been studied. The first article reported on determinants of physical activity among female adolescents. Ethnic group and age were found to be significant influences on physical activity. Caucasians were more active than non-Caucasians. Younger persons were more active than older persons. The authors suggested that physical activity needs to be promoted among female adolescents. In a second study of children of both genders, age was found to be a contributing factor to the identification of clusters of children whose self-perceptions were contingent upon either self-reliance or social feedback as preferred sources of competence information.

15. Individual Characteristics That May Influence Group (Team) Dynamics--Aggression Orientation, Commitment Orientation, Goal Orientation, Human Resource Capacities, and Image or Visualization Capability: There is convincing but perfunctory evidence of a relationship between all of these characteristics and athletic performance at the group (team) level.

Although a reiteration of these selected characteristics will appear to be redundant, a brief summary is included to address the second research question: whether or not it was possible to extrapolate from findings concerning individual characteristics to applications at the group or team level? It is possible to conclude that the findings are convincing although in a few studies the findings are merely perfunctory or not conclusive from a scientific point-of-view.

One pair of authors who studied aggressiveness behaviors in soccer players concluded that players who described themselves as more likely to aggress against an opponent, also were more likely to identify a larger number of teammates who would aggress in a similar situation. Also, their results suggested that young athletes' aggressive behavior is related to their teams' "moral atmosphere" which includes team aggressive norms and players' perceptions of those norms.

Two other authors said, in essence, that teammate social support in a psychologically cooperative atmosphere is an essential contributor to successful athletic performance. A proactive working milieu stimulates athletes to develop a shared commitment for performance success. The study of flow states in figure skaters indicated that a sense of unity among team members was a necessary ingredient of flow success. Positive mental attitude and unity with partner were significant factors.

In terms of goal orientation, one author submits that coaches are able to motivate teams better or more positively if they understand the goals of individual team members.

Human resource capacities encompass a lot of characteristics. One study among collegiate basketball players showed that while the strategy of the coach influences the type

of players recruited and contributes to the athlete's decision-making, the athlete is the decisive factor to control the performance and assimilate the coach's strategy to play with the team of assembled athletes. While the human resources are ultimately what matters in predicting outcomes, the coach's strategies are assimilated and responded to. Team performance is directly affected by the collective strategy utilized by the athlete, team members and the coach. Another pair of authors said the performance of team members is influenced by behavioral guides inherent in the moral atmosphere of the team, created collectively or cumulatively through the contributions of individuals, teammates, coaches, parents, educators and society.

Finally, when analyzing imagery or visualization capability, there is some empirical evidence that it plays a role at the team level. Some investigators, in studying soccer players' reactions to manipulated spatial dimensions of playing fields, found that experts were better at adapting to modifications than non-experts because the former had learned from similar group or team experiences how to react. In support of this finding, other authors concluded that perceptual abilities and the ability to adapt are crucial to effective team performance in highly intense team contests.

A summary of all the evidence or lack of evidence for all of the characteristics reviewed in this paper is presented in Table 2, next page.

Table 2: Summary of Evidence for Studied Relationships

Characteristic Studied	Types of Evidence*
<u>Psychological Characteristics</u>	
1. Aggression Orientation	Some Empirical
2. Anxiety/Negativism (Perception of)	Substantial Empirical
3. Commitment Orientation	Some Empirical
4. Competition Orientation	Some Empirical
5. Decisional Processing Capability	Some Empirical
6. Global Self-Worth (Perception of)	Substantial Empirical
7. Goal Orientation	Some Empirical
8. Imagery or Visualization Capability	Substantial Empirical
9. Participation/Involvement (Perception of)	Some Empirical
10. Perfection (Achievement) Orientation	Some Empirical
11. Physical Competence (Perception of)	Substantial Empirical
12. Sex Role/Gender Orientation	Some Empirical
<u>Social-Psychological and Sociological Characteristics</u>	
1. Social-Psychological Perspectives	Some Empirical
2. Demographic Characteristics	Some Empirical
<u>Group (Team) Psychological Characteristics</u>	
1. Aggression Orientation	Some Empirical
2. Commitment Orientation	Some Empirical
3. Goal Orientation	Some Empirical
4. Human Resources Capacities	Some Empirical
5. Imagery or Visualization Capability	Some Empirical

*Empirical refers to original source research studies and literature reviews conducted by other authors which contain scientifically-based studies. "Substantial" was derived on the basis of six or more supportive articles. "Some" was derived on the basis of five or fewer supportive articles.

B. Recommendations

In concluding this section of the paper, it is appropriate to make a few recommendations based upon the findings and conclusions reported above.

1. Individual athletes, as the decisive factor in athletic performance, may achieve improved outcomes if they study and learn more about sports psychology. This includes how to develop mental toughness; to avoid reactive and proactive negativism; to reduce anxiety and stress; to process information quickly and decisively to react appropriately in competitive situations; to support each other in team sports; to avoid burnout; and to be better prepared both physically and mentally for success and failures. (See the following references: Hellandsig, 1998; Raedeke, 1997; Rosenfeld and Richman, 1997; Weiss, Ebbeck, and Horn, 1997; McGill and Schoenfelder-Zohdi, 1996; Ludwig, 1996; Wright, Smart, and McMahan, 1995; Wittig and Schurr, 1994; Jackson, 1992).
2. Teammates may improve team performance by learning how to utilize sport psychology to support each other and improve upon the traits mentioned in #1 above. (See the following references: Rosenfeld and Richman, 1997; Wright, Smart, and McMahan, 1995).
3. Coaches may possibly gain a performance edge in team sports, and in individual sports, by seeking ways to understand what motivates players; by understanding the dynamics of mental toughness; by learning the intricacies of setting and achieving goals; by enhancing imagery of game situations through practice; and, by gaining a better understanding of the roles of commitment, goals, human resource capacities, and imagery in enhancing player performance. (See the following references: Hellandsig, 1998; Iwasaki and Havitz, 1998; Laugier and Cadopi, 1996; Fung and Fu, 1995; Wright, Smart, and McMahan, 1995; Weinberg, 1994; Murphy, 1990).

4. Parents of athletes and non-athletes may be able to promote more traits of athleticism in their offspring by studying and implementing more effective ways to socialize their children to excel in and enjoy athletic pursuits. Parental examples are important psychological and sociological role models. (See the following references: Bungum and Vincent, 1997; Hoyle and Leff, 1997; Brustad, 1992).
5. Educators may be able to help prepare individuals and teams to have more positive performance experiences by enhancing curricula and physical education training to include instruction about sports psychology and the role of psychological characteristics in sports performance outcomes. At a minimum, perhaps more attention should be given to acknowledging sex role/gender orientations and developing methods to counter negatives associated with these orientations and stereotypes. (See the following references: Hellandsig, 1998; Ludwig, 1996; Krane and Williams, 1994; Glenn and Horn, 1993; Brustad, 1992).
6. Society might benefit considerably if its citizens better understand sports psychology and the role that psychological characteristics play in athletic performance. If, for example, we were to place more emphasis on helping athletes to achieve satisfaction in performance rather than on winning at all costs, we might be able to reduce spectator violence and aggression towards officials and athletes in sports competition. (See the following references: Abernethy, 1999; Stein, Kimiecik, Daniels, and Jackson, 1995).

VI. RESEARCH CAVEATS AND FUTURE STUDY IDEAS

In conducting this literature review project, a few potential ideas or suggestions were identified that, if implemented at the outset, might have served to improve the report. These are briefly discussed below:

1. The literature search elicited a mixture of both scientific studies and literature review summaries. The latter, of course, included the works of several other investigators. There was not sufficient time to retrieve, read, and synthesize the plethora of articles referenced by others. Hence, the paper is framed upon some articles syntheses developed by other authors. It is assumed that they had interpreted the findings of the synthesized studies correctly.
2. Given the number of literature review summaries that were identified, it might have been more manageable, and perhaps just as beneficial to the outcome of this paper, if it were concentrated on a review of only original scientifically-based studies. That approach would have precluded the need to have to rely upon other authors' literature review conclusions. The risk in this approach, however, is that it is easy to ignore or to not have had exposure to several excellent previously completed studies reported accurately by intermediate authors.
3. It became clear in retrieving and assembling the periodical articles that they contained comprehensive summaries of a lot of very technical studies containing a lot of professional psychological jargon. Although the present author had completed coursework on group testing (psychological methods), it was difficult at first to totally understand the meanings of some terms and/or to become totally familiar with the psychological scales or instruments used to measure the concepts without more in-depth study. Thus, it is possible that some of the elicited findings might be misinterpreted.

4. As the various psychological characteristics that had been previously studied in relation to human athletic performance were identified, it became apparent that there were many. Perhaps, this paper could have been more selective or focused on a narrower range of characteristics. There is a lot of overlap in the categories of characteristics summarized, i.e., some of them obviously do not appear to be mutually exclusive. The advantage of this is that the research on only a few selected characteristics might have been more thorough. Conversely, the study was possibly made more complete by including a broad range of research articles.

Future study in this area could be devoted to further explorations of the influence of selected psychological characteristics on athletic performance. It does not appear that definitive conclusions have been reached in the areas of aggression, commitment, competition, decisional-processing, global self-worth, goal setting, participation, perfectionistic tendencies and sex role/gender, and their relationship to athletic performance. Also, researchers should continue to study the characteristics identified in this paper, but perhaps more specifically and with more diverse groups. Although some evidence of relationships has been found with some types of athletes and in some types of athletic settings, it would be interesting to know if the same findings could be elicited in studies of diverse types of athletes in different sports. There may be some factor or set of factors that predispose a particular type of athlete in a particular sport to react the way he/she does. If there are differences we need a lot more research to identify these factors and to be able to explain the differences. In short, research should be concentrated in those areas where there are equivocal findings, in diverse athletic settings, or in a combination of the two.

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